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May 7, 2001

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie Roman Salas
Office of the Secretary
Federal Communications Commission
445 Twelfth Street, S.W., Room TW-A325
Washington, D.C. 20554

Re: IB Docket No. 00-248

Dear Ms. Salas:

In accordance with paragraph 98 of the Notice of Proposed Rulemaking in this proceeding, we are submitting herewith a diskette in read-only format with the Reply Comments of Spacenet Inc. and StarBand Communications Inc. The name on the file on this diskette is "Reply_Comments.doc" Also submitted is an original and nine paper copies of the Reply Comments.

If there are any questions concerning this matter, please let me know.

Sincerely yours,

Theodore D. Frank
Counsel for Spacenet Inc. &
StarBand Communications Inc.

cc: International Transcription Service, Inc. (by Federal Express)

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List A B C D E

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
2000 Biennial Regulatory Review --	)	
Streamlining and Other Revisions of Part 25 of	)	IB Docket No. 00-248
the Commission's Rules Governing the Licensing	)	
of, and Spectrum Usage by, Satellite Network	)	
Earth Stations and Space Stations	)	

To: The Commission

Reply Comments of Spacenet Inc. and StarBand Communications Inc.

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To: The Commission

REPLY COMMENTS OF SPACENET INC. AND STARBAND COMMUNICATIONS INC.

Spacenet Inc. ("Spacenet") and StarBand Communications Inc. ("StarBand") (collectively "Spacenet/StarBand") hereby submit these reply comments in response to the Comments filed in this proceeding.

INTRODUCTION

In our opening Comments, Spacenet/StarBand supported the Commission's plans to streamline the processing of VSAT applications and to modify its rules to reflect changes in satellite technology since the current rules were adopted almost twenty years ago. However, Spacenet/StarBand also urged the Commission to revisit and revise several of its proposals because they were unnecessary, could adversely affect the VSAT industry, and were therefore unjustifiably regulatory.

Many of the proposals advanced by Spacenet/StarBand found support in the Comments of the other participants, while some of the other participants urged positions

that we believe are unfounded and overly burdensome. These Reply Comments set forth our support for proposals which were similar, but improve, the positions we took in our opening Comments, and our opposition to positions that we believe would disserve the public interest.

SUMMARY OF REPLY

We believe that the proposal of Hughes Network Systems to replace the separate earth station antenna off-axis gain mask and on-axis EIRP density limit for routine processing with an off-axis EIRP density mask has merit, and should be adopted by the Commission with minor amendments.[1] This approach (i) separates the receive protection contour from the transmit off-axis emissions limit, allowing independent regulation of these parameters, (ii) directly regulates the emissions of earth stations towards other satellites rather than doing so indirectly as in the current rules, and (iii) subsumes the Commission's "reduced power" option for small antennas in a more general and simpler rule. By routinely processing applications that satisfy the off-axis EIRP mask, the FCC will substantially reduce the regulatory burden on applicants and the processing required by the FCC staff, without compromising the current level of interference protection.

We continue to oppose as unnecessary any requirement to coordinate non-compliant antennas with operators of satellites located at off-axis angles where the earth station satisfies the EIRP density mask. Those satellites will not receive more illumination from the non-compliant earth stations than from earth stations that are currently routinely licensed. Therefore, any coordination obligation should be limited to

[1] The two minor modifications are (a) to measure compliance with the emission mask at 2° rather than 1.8° and (b) to specify the off-axis angle of compliance in directions other than the orbital plane.

satellites located at off-axis angles where the earth stations do not satisfy the EIRP density mask. Furthermore, applicants who successfully coordinate non-routine operations should not be required to reduce power or make other modifications to their facilities in order to satisfy the demands of a later-filed 2°-compliant satellite. Such a rule would place valuable existing services at the mercy of subsequent satellite operators, and could stifle deployment of innovative VSAT networks.

Several commenters proposed requiring VSAT applicants to serve their applications on, or otherwise affirmatively contact, additional satellite operators. These proposals would only impose added burdens on VSAT operators and shift the burden of information sharing between applicants and other interested parties. The public notice procedure used by the Commission (and by many other government agencies) equitably shares these burdens. Similarly, the Commission should make it clear that, since any coordination requirement, whether imposed prior to the filing of a VSAT application or after the normal public notice period, poses a risk that a recalcitrant (or merely disinterested) satellite operator could inordinately delay service, any failure by a satellite operator to respond to a coordination request will be deemed a consent to the grant of the application.

The satellite industry participants in this proceeding unanimously oppose the Commission's proposal to require earth stations using random access techniques to reduce power. We believe that the Commission should recognize the overwhelming evidence in the record showing that there is no problem to fix, and should not regulate random access techniques.

We agree with Hughes that the Commission's proposal to define "wideband" and "narrowband," which we supported in our Comments, is somewhat ambiguous, and now recommend that "wideband" be defined as a bandwidth of 3 MHz or greater and narrowband" as a bandwidth less than 3 MHz.

Although we do not believe that earth station applicants should be burdened with a requirement to affirmatively contact the operators of satellites other than those with whom coordination may be required, Spacenet/StarBand agree that non-proprietary information that is legitimately useful to determine the interference potential of proposed earth station operations should be included in public notices. However, some of the proposals in the various opening comments could require the disclosure of proprietary information or are impracticable, and should not be adopted.

We disagree strongly with PanAmSat's expressions of concern over the deployment of "consumer terminals." PanAmSat's argument amounts to an unwillingness to trust earth station operators to conduct operations in conformity with their authorizations. There is no basis for this distrust. The Commission routinely relies on its licensees to comply with the terms of their authorizations, and there is no reason to believe that earth station operators are any less likely to honor their legal obligations to the FCC than any other Commission licensees.

Finally, we believe that the Commission's proposal to limit VSAT renewals to the number of units installed at the time of renewal would unnecessarily hamper licensees' ability to grow their business and would contradict the very purpose of blanket licensing.

COMMENTS

I. The Commission Should Change the Definition of A "Compliant" Earth Station

As we argued in our opening Comments, the Commission should modify its definition of a "complaint" earth station to include earth stations with smaller antennas. These antennas have numerous advantages over larger antennas, and, as the Commission is aware, are becoming more and more popular. Modifying the definition to reflect current technological developments in the satellite and earth station industry will permit the Commission to streamline the processing of applications for smaller earth stations.[2] Hughes Network Systems, et al. ("Hughes") urged the Commission to adopt a similar substantive proposal, but also proposed specific changes in the Part 25 rules themselves to implement its proposal.[3] Those changes would simplify the rules and make the rules applicable to Ku band VSAT networks parallel the rules for the Ka band. Hughes's approach is meritorious and should be adopted.

In our opening comments, we advocated that the "baseline" EIRP density be raised from the current -14 dBW/4kHz to -11 dBW/4kHz if the Commission adopted its proposals regarding power reductions for VSAT earth stations using sub-meter antennas and/or random access techniques. In light of comments from the industry, we clarify here that we see no need to raise the "baseline" power density as long as the status quo is maintained, as it is with our off-axis EIRP density mask and random access proposals.

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[2] *See* Comments of Spacenet/StarBand at 11–14.

[3] *See* Joint Comments of Hughes Network Systems, et al. ("Comments of Hughes") at 7–13 and Appendix B.

A. Compliance Should Be Determined by an Off-Axis EIRP Density Mask Rather Than by Separate Antenna Gain Pattern and EIRP Density Requirements

The current rules impose both an off-axis antenna gain mask and an EIRP spectral density limit for routinely-processed earth station applications.[4] Together, these restrictions limit the off-axis EIRP density, and consequently the incidental illumination of satellites other than the target satellite. Because the interference environment in the GSO orbital belt depends on the off-axis EIRP density of earth stations, Hughes suggested replacing the current Ku-band rules with an off-axis EIRP mask similar to that used by the Commission in its recent Ka band rule.[5] In Hughes's proposal, Section 25.209 defines the receive gain contour that is entitled to protection from interference, while Section 25.134 addresses the transmit off-axis EIRP density.

This approach, which separates the receive pattern specification from the off-axis emissions specification, rationalizes the rules and allows each parameter to be tailored independently to prevent unacceptable interference in both uplink and downlink paths. This rule change will also confer several other benefits. First, it directly controls the particular earth station transmit parameter that affects the satellites' interference environment. Second, it reflects the more recent engineering and regulatory views that informed the Ka-band rulemaking. Third, it allows system operators the flexibility to select the antennas and operating modes that best suit each application without allowing any combination to radiate unacceptable interference toward other satellites.[6] Finally, it

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[4] *See* Comments of Spacenet/StarBand at 11 n.27.

[5] *See* Comments of Hughes at 8–13; 47 C.F.R. § 25.138 (effective October 10, 2000).

[6] *See id.* at 12.

is a general and simple standard that is easily understood, readily tested, and furthers the Commission's goal of streamlining its rules.

Implementing these proposals will reduce the regulatory burden on earth station operators and the processing burden on the FCC's staff without risking unacceptable interference to other satellite communications systems. It should be adopted, albeit with the modifications set forth below.

B. Antennas That Satisfy the Off-Axis EIRP Mask at Angles of 2° and Greater in the Orbital Plane and 3° and Greater in Other Directions Should Be Compliant and Routinely Processed

Under the Commission's current rules, applications are routinely processed when the antenna gain mask of Section 25.209 and the applicable power density limits are satisfied. Under the Hughes proposal, applications that satisfy its proposed off-axis EIRP density mask would be routinely processed. Spacenet/StarBand urge the Commission to make two changes in the Hughes' proposal.

First, we believe that compliance with the EIRP density mask should be measured beginning at 2° off-axis in the orbital plane rather than 1.8° proposed by Hughes. As we showed in our opening Comments, measuring compliance at 2° does not increase the incidental illumination of other satellites compared to the current rules for routinely processed earth stations and, since satellites that comply with the Commission's 2° spacing policy actually appear nominally 2.2° apart as viewed from the earth stations, a 2° requirement provides a reasonable margin of safety.

Second, Hughes does not address off-axis EIRP levels in directions other than the orbital plane as it appears from the earth station location. In our Comments, we suggested that the Commission specify the EIRP levels at 3° and higher in the plane

perpendicular to the orbital plane. We suggested this specification in order to facilitate the use of elliptical antennas, thereby expanding the range of services that can be provided to consumers and small businesses.

On further reflection, we believe that the Commission should specify the permissible off-axis EIRP in all directions. Adoption of an off-axis limit in directions other than the orbital plane will avoid creating the impression that such emissions are uncontrolled. Moreover, by regulating all off-axis emissions, the Commission's rules will track more closely the ITU standard. Accordingly, we recommend that the Commission add language implementing this provision to the Hughes proposal.[7]

II. Application and Processing Procedures for Non-Compliant Antennas Should Be Streamlined

Adopting the proposals advanced here and by Hughes will dramatically reduce the number of applications that require non-routine processing without compromising interference protection relative to the current rule. We recognize, however, that some VSAT applicants may seek authorization for systems or individual earth stations that do not satisfy these more relaxed definitions of compliant antennas. These non-compliant operations[8] should, of course, be evaluated on a case-by-case basis to determine whether

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[7] Specifically, we propose to add the following subsection to Hughes's proposed Section 25.134(a):

(1)(b) If the GSO FSS earth station antenna off-axis EIRP spectral density for co-polarized digital signals does not exceed the following values, under clear sky conditions, in all other directions:

$32 - 25 \log(\theta)$	dBW/4kHz	for	$3° \le \theta \le 7°$
11	dBW/4kHz	for	$7° < \theta \le 9.2°$
$35 - 25 \log(\theta)$	dBW/4kHz	for	$9.2° < \theta \le 48°$
-7	dBW/4kHz	for	$48° < \theta \le 180°$

where θ is the angle in degrees from the axis of the main lobe.

[8] Throughout this discussion, "non-compliant" refers to earth stations or proposed earth stations that do not satisfy the off-axis EIRP density mask proposed in this Reply.

they will cause harmful interference to 2°-complaint satellite systems. However, we continue to believe that the Commission's proposals to require VSAT operators to (i) reduced power or (ii) obtain affidavits from or coordinate with satellite operators with satellites within 6° of the target satellite are unduly burdensome, unnecessary, and can thwart, if not preclude, the introduction of new, innovative, and useful services. The proposals by others participants that would restrict the use of non-compliant earth stations suffer from the same defects.

A. The Commission's "Reduced Power" Option and Affidavit Proposals Are Unduly Burdensome and Unnecessary

1. The Reduced Power Option is Subsumed in the More General Off-Axis EIRP Mask Proposal

In its *Notice*, the Commission proposed that an applicant using an antenna that did not meet the off-axis gain requirements of the Commission's proposed rule could reduce power by the amount necessary to bring its emissions at all regulated off-axis angles to the levels allowed by the current composite rule.[9] The EIRP density mask proposal accomplishes the same result, but is more general and has the advantage that it regulates the earth station parameter that directly affects interference. Accordingly, the Commission's proposal is unnecessary if it adopts the approach recommended here.

2. Mandatory Coordination Should Be Limited to Satellites Located in the Earth Station's Zone of Non-Compliance

There should be no requirement to coordinate the operation of compliant earth stations, as defined in this Reply, with satellite operators because compliant earth stations do not illuminate adjacent satellites with more energy than is allowed under the current rules for routinely-approved antennas. We agree that applicants proposing to license

non-compliant earth stations should be required to coordinate their operations, but we believe that coordination should be required only with those satellites that will receive more illumination from the earth station than that allowed by the EIRP density mask.[10] For example, if an applicant proposes to license an earth station that does not satisfy the EIRP density mask at off-axis angles between 2° and 3.2°, but that does satisfy the mask at off-axis angles greater than 3.2°, that applicant should be required to coordinate its operations with the operators of satellites located within 3.2° of the target satellite. There is no more reason to require coordination with satellites from 3.2° to 6° than there is to require such coordination for an antenna that complies with current Section 25.209 of the rules—neither antenna emits more energy towards these satellites than is currently allowed for routinely approved antennas.[11]

3. Non-Compliant Earth Stations Coordinated With Satellites in Their Zones of Non-Compliance Should Not be Required to Accommodate Future Satellites

Telesat Canada asks the Commission to "make it clear that the affidavit approach has inherent risk to the earth station operator and that other means, such as antenna

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[9] *See Notice* at ¶¶ 15–19 and Appendix B, proposed Section 25.220.

[10] To the extent that international treaties may require coordination with foreign satellites beyond this, of course, the treaty obligations would control.

[11] PanAmSat suggests that the Commission require coordination with satellite operators with 6° on either side of the arc the applicant is seeking to coordinate. *See* Comments of PanAmSat at p. 9. PanAmSat's proposal appears to assume that the VSAT applicant will seek either ALSAT authorization or authority to communicate with satellites within 12° of each other such that the arc the applicant is seeking to use is contiguous. That may not be the case. Applicants should only be required to coordinate on either side of the satellites to which the applicant proposes to communicate. As noted above, we continue to believe that the 6° proposal is overly burdensome and that coordination is only necessary to the extent that earth station fails to meet the prescribed emission mask.

replacement or power reduction, may be required in the future"[12] if the earth station cannot be coordinated with a future 2°-complaint satellite. This position is currently reflected in the provision of the Commission's proposed Section 25.220(e)(2) that non-compliant earth station licenses "will include, as a condition on th[e] license, that if no good faith agreement can be reached between the satellite operator and the operator of a future 2° compliant satellite, the earth station operator shall reduce its power to those levels that would accommodate the 2° compliant satellite."

As we noted in our Comments, such a rule is at variance with the Commission's general approach that stations have a "right to be protected from any others that start operations at a later date"[13] and could discourage VSAT operators from offering new and innovative services.[14] Any VSAT operator launching such a service using non-compliant earth stations would do so at its peril, since a subsequent satellite operator could force them to cease providing the service. The curtailment of service will result in consumers losing a valuable service — one, in many cases, on which they have come to depend. Further, the lost service could provide significant public benefits in terms of providing services to rural and underserved areas, while the service offered by the new satellite vendor could offer no such public benefits. Since the initial coordination with the prior satellite demonstrated that the non-compliant system could be accommodated, there is no public interest benefit in risking the loss of existing services.[15]

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[12] Comments of Telesat Canada at 4.

[13] Comments of Spacenet/StarBand at 25 (quoting Federal Communications Commission, *Connecting the Globe: A Regulator's Guide to Building a Global Information Community* (1999)).

[14] *See* Comments of Spacenet/StarBand at 24–26.

[15] While we recognize that this condition may make sense where there are vacant orbital locations such that a nonconforming earth station network could preclude a new 2°-complaint satellite because

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Indeed, Telesat does not articulate any policy reason why future satellite systems should be protected when existing systems can tolerate the non-compliant earth station.[16] At best, such a rule can be justified on the theory that future satellite systems can offer better and more innovative services than VSAT operators using coordinated but non-compliant earth stations if the satellite vendors are assured that all earth stations will comply with the Commission's earth-station antenna rules. Such a proposal is betting a bird in the bush is better than one in the hand. As that old adage wisely advises, the known service should be retained; there is no basis for a prophylactic rule to protect future satellites.

B. PanAmSat's Comments Regarding the Reduced-Power "Equivalent Protection" Option Are Not Supported by the Evidence in the Record

In its comments, PanAmSat expressed concern that the Commission's proposal to require non-complaint earth stations to reduce power, *i.e.*, to afford adjacent satellites "equivalent protection," would (i) proliferate nonstandard antenna patterns and (ii) make it more difficult to identify an interfering station. PanAmSat does not recommend any

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the earth station was never coordinated with the user of the orbital slot, the usable satellite arc is now fully occupied and thus any non-complaint system would have to be coordinated with an actual or planned satellite system. Thus, this policy justification for the rule no longer exists.

[16] When the Commission initially adopted the requirement to coordinate with satellites within 6° of the target satellite, it relied on claims of AT&T that non-compliant antennas could cause harm to satellite that far away. *See* In The Matter Of Routine Licensing Of Large Networks Of Small Antenna Earth Stations Operating in the 12/14 GHz Frequency Bands, CC Docket No. 90-219, *Report and Order* (Dec. 17, 1991) 6 FCC Rcd. 7372 at ¶¶ 16–17. However, there is no reason to presume that all non-compliant antennas will cause harm to satellites that far away from the target satellite, and our proposal would require coordination with any satellite that would experience power levels in excess of the approved emission mask.

specific change to the Commission's proposal but recommends that the Commission allow the industry to examine the issue and develop a means to address the problem. [17]

While further industry study of the issue could be useful, provided the consultative process is open and fair, we do not believe that PanAmSat's concerns warrant adoption of rules different than the ones we and Hughes have proposed. Indeed, PanAmSat does not suggest that the current regulations with respect to the off-axis emissions of earth stations are too liberal. Rather, its comments in this proceeding and the previous *Spacenet Petition* proceeding indicate that it thinks these restrictions can be relaxed.[18] Thus, its concerns appear to be related to the "self-certification" process, which would permit non-compliant operators to simply reduce power and certify that they came within the permissible power limitation without submitting anything to the Commission or to any satellite operator that would establish that their emissions are within the permissible limits.

The off-axis EIRP density mask proposal limits earth station emissions to the same values currently allowed for routinely authorized applications. Therefore, PanAmSat's underlying concern seems to be about the efficacy and trustworthiness of earth station licensees' certifications and their commitments to conducting operations in conformity with their authorizations, rather than the technical merit of the proposal. The Commission trusts earth station operators when they certify that they are installing antennas that comply with current Section 25.209. It also trusts them to operate their

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[17] *See* Comments of PanAmSat at 3–4.

[18] *See, e.g., id.* at 3 ("the current rules are unduly restrictive"); Comments of PanAmSat in the *Spacenet Petition* proceeding at 2 (the current rules are "more restrictive than they need to be, or should be").

stations in conformity with their authorizations. There is simply no basis for the Commission to assume that VSAT operators will not honor their legal obligations to the Commission. Furthermore, there is no reason to believe that interference from "non-standard" antennas is more difficult to identify than interference from "standard" antennas.

C. The Commission Should Raise the Downlink EIRP Densities for Digital Carriers

The commenters generally agree that raising the downlink EIRP densities for digital carriers is appropriate.[19] The only question is, by what amount. As we pointed out in our initial comments, improvements in satellite power output, transponder bandwidth, and antenna patterns have raised workable power density levels by approximately 7 dB since the current rules were written, allowing wideband digital downlink EIRP densities of +13 dBW/4kHz.[20] Because such improvements are likely to continue, it would be prudent to implement a rule that can be "grown into" rather than one that will be outgrown very shortly. Furthermore, as we pointed out in our initial comments, an increase to +16 dBW/4kHz is necessary to offset the interference that will be caused to VSAT downlinks by NGSO operations.[21]

On a related matter, Spacenet/StarBand support the request by Hughes to clarify that the hub station EIRP limit of 78.3 dBW specified in Section 25.134(a) and (b) are per carrier values.[22]

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[19] *See* Comments of Hughes at 15–17; Comments of PanAmSat at 9–10; Comments of Loral at 10–11.

[20] *See id.* at 30–34 and Exhibit B; *see also* Comments of Hughes at 15–17; Comments of PanAmSat at 9–10; Comments of Loral at 10.

[21] *See* Comments of Spacenet/StarBand at 30–34 and Exhibit B.

[22] *See* Comments of Hughes at 27.

D. Unnecessary Burdens Should Not Be Placed on Earth Station Applicants

1. The Commission's Existing Public Notice Procedures are Sufficient to Inform Interested Parties

Several commenters suggested that earth station applicants should be required affirmatively to contact satellite operators concerning their applications.[23] We believe these proposals would imposes an unnecessary burden on VSAT applicants. The information interested parties need is readily available, especially if the Commission requires VSAT applicants to provide some, or all, of the additional information proposed in the *Notice* or if the Commission requires applicants to file electronically.

The public notice procedure employed by the Commission is one used historically by government agencies to notify interested parties of proposed actions. This procedure properly shares the burdens between applicants and other interested parties.

2. Any Coordination Requirement Should Include a Hard Deadline to Facilitate Coordination

In its *Notice,* the Commission proposes a sixty-day period after the expiration of the 30-day notice period, during which any necessary coordination would be conducted.[24]

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[23] *See* Comments of PanAmSat at ii (the Commission should require applicants proposing to use antennas with non-standard gain patterns to serve applications on "potentially affected satellite operators"); *id.* at 5 (same, specifying recipients as "the operators of all co-frequency satellites with [sic] six degrees of the eastern and western edges of the coordination arc specified in the...application"); Comments of GE at 6 (applicants should be required to supply certain information to "potentially affected space station operators"); Comments of Loral at 6–7 (the Commission should require applicants to coordinate with satellites within 6° of the target satellite(s) before filing); Comments of Telesat Canada at 3 ("explicit agreements should be required with all satellite operators—U.S. and foreign-licensed—having satellites within six degrees of [the target satellite]").

[24] *See Notice* at ¶¶ 34–36.

The Commission states that it expects satellite operators to be able to coordinate "fairly easily" and that this obligation will not be very burdensome.[25]

As we noted in our opening Comments, this proposal offers some hope for streamlining processing of VSAT applications and obtaining at least partial grants of applications. However, we are not as sanguine as the Commission about the willingness of satellite operators to coordinate, and are concerned that market forces may not be sufficient to prevent strategic behavior by satellite operators. We therefore urge the Commission to include in this proposal a safeguard to help prevent recalcitrant (or merely disinterested) satellite operators from delaying earth station applications unnecessarily. Specifically, we suggest that the Commission provide in its new rules that objections not raised during the thirty-day comment period and coordination issues that have not been negotiated in good faith during the coordination period be waived.[26] This is particularly important to the extent that coordination is required with foreign operators, over which the Commission has no direct control.

III. The Commission Should Not Regulate Random Access Techniques that Allow Statistically Infrequent Simultaneous Earth Station Transmissions of Short Duration

The unanimous voice of satellite and earth station operators, expressed in the initial comments in this proceeding and the comments in the previous *Spacenet Petition* proceeding, implores the Commission not to implement its proposal to require earth stations using random-access techniques to reduce power. Members of the industry not

[25] *Id.* at ¶ 34.

[26] The Commission uses a similar approach in its frequency coordination rules in Part 101. *See* generally 47 C.F.R. § 101(d) (requiring notified parties to respond "as quickly as possible" within a 30-day response period, and allowing applicants to file without a response after 30 days).

only express no concerns about the use of random access techniques, but affirmatively deny, based on their many years of experience with VSAT networks using these techniques, that the concerns raised by the Commission are warranted.

Further, the merely theoretical possibility of unacceptable interference raised by the Commission and by Aloha Networks will not manifest itself for sound and reliable market reasons. It is in the commercial interest of network operators to select operating parameters that provide a competitive and commercially acceptable service. It is also in the interests of each member of the satellite industry to be responsive to the needs of other members, because the interference environment affects all of us. These market forces will operate to prevent operators from deploying random access techniques in any manner that would cause unacceptable interference.[27]

For these very good reasons, the entire satellite industry asks the Commission not to regulate random access techniques. If the Commission, contrary to the overwhelming evidence in the record and the unanimous voice of the industry, nevertheless insists on regulating random access techniques, Spacenet/StarBand respectfully ask the Commission to implement any regulation in the form of a limit on the average power radiated by the VSAT stations in the network and to grandfather existing systems or give VSAT operators a reasonable period of time to satisfy the new rules. [28]

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[27] If, and when, actual interference problems occur, the Commission can take action to address the problem. At that point, the precise nature of the problem will be better known, the potential fixes will be clearer, and the Commission and the industry can frame rules that will facilitate the provision of service while addressing the interference problems.

[28] The Commission's current rules specifically apply not to networks as a whole, but to each VSAT transmitter individually. Section 25.134(a) provides in pertinent part that "all applications for digital VSAT networks with...earth station antennas with maximum input power density of -14 dBW/4kHz...will be processed routinely." Since the record both in this proceeding and the *Spacenet Petition* proceeding overwhelmingly demonstrates that industry-standard random access techniques do

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A. There is Overwhelming Evidence that Existing Random Access Techniques Do Not Cause Unacceptable Interference to Other Satellites

Every commenter with direct experience has stated that it is unaware of any problem caused by random access techniques during the many years that they have been in use by the VSAT industry.[29] This is not surprising, given that the power density signature of VSAT network emissions, including the statistically infrequent, short duration simultaneous transmissions due to random access techniques, is very similar both in power probability and in spectral content to the other sources of noise that satellite systems are designed to tolerate.[30] Existing implementations of random access techniques simply do not cause unacceptable interference.

B. Market Forces Will Prevent Network Operators From Deploying Random Access Techniques in a Manner that Would Cause Unacceptable Interference to Other Satellites

If there were good reasons to believe that earth station operators would, in the future, deploy random access techniques in a manner that would cause unacceptable interference, regulating the use of these techniques might be justified. For example, Aloha Networks suggests that network operators might decide to use loading values of

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not cause unacceptable interference, and that market forces will insure that they will not do so in the future, the Commission should simply state that Section 25.134 means what it says on its face—that if each individual VSAT transmitter satisfies a power density standard equivalent to the current standard, the network will be processed routinely.

[29] *See* Comments of Hughes at 22 ("Hughes...is not aware of any interference issues that are attributable to Aloha collisions."); Comments of PanAmsat in the *Spacenet Petition* proceeding at 1 ("there is no evidence that [random access techniques] have ever caused unacceptable or harmful interference to other users"); Comments of GE at 4 ("Our experience has been that [operations using random access] have not resulted in unacceptable interference."); Comments of Loral at 12 ("Loral is unaware of any reported incidents of unacceptable interference").

[30] *See* Comments of Spacenet/StarBand at 38–39 and Exhibit D.

100%, resulting in two-station collision probability of approximately 8%.[31] However, reliable market forces will prevent this. First, network operators must offer a commercially viable service to stay in business. Because commercial viability declines as loading is increased and response time worsens, network operators have an entirely internal incentive to minimize collisions.

C. If the Commission Nevertheless Finds that Random Access Techniques Should Be Regulated, It Should Limit the Average Power of the Network and the Maximum Duration of Allowable Simultaneous Transmissions

Should the Commission nevertheless decide that the public interest requires it to place regulatory limits on the emissions from networks as a whole, Spacenet/StarBand respectfully ask the Commission to implement any regulation in the form of a limit on the average power radiated toward the target satellite by the network, as proposed by Hughes in its comments in the Spacenet Petition proceeding. This approach is the simplest possible, and for the reasons given in Hughes's comments in the *Spacenet Petition* proceeding and in our initial comments in this proceeding, would prevent unacceptable interference without unnecessarily complex regulations.

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[31] *See* Comments of Aloha Systems at 8. Aloha Networks also proposes to regulate earth stations using random access techniques by requiring them to reduce power by a factor equivalent to the number of simultaneous transmissions having a probability greater than 0.001 (i.e., 0.1%). To justify this standard, which is ten times stricter than the 1% determined to be *de minimis* by the Commission, Aloha Networks cites Section 4.2 of ETSI document TBR 28 for the proposition that some regulators require a probability as low as 0.0001 (i.e., 0.01%). Section 4.2, however, is a specification for *on-axis spurious radiation*—radiation at frequencies other than those one is authorized to emit, which would affect other services on the target satellite. Such restrictions, because they deal with on-axis, out-of-band emissions, bear no relationship to the in-band, off-axis emissions of earth stations.

IV. Miscellaneous Proposals

A. Defining "Wideband" & "Narrowband"

In our Comments, Spacenet/StarBand advocated adoption of the Commission's proposed definitions of the terms "wideband" and "narrowband." On further consideration in light of the comments of other industry participants, we agree that the Commission's proposed definitions are ambiguous. Accordingly, we recommend that the Commission define "narrowband" to refer to modulated carriers with a bandwidth of less than 3 MHz and "wideband" to refer to modulated carriers with a bandwidth of 3 MHz or greater.

B. Additional Public Notice Information

PanAmSat and GE suggest that applicants should provide additional information in their applications.[32] While we believe that the longstanding practice of publishing public notices is sufficient to inform interested parties of pending applications, requiring applicants to provide information that is legitimately useful for evaluating the potential interference from a proposed earth station could expedite the processing of applications and avoid delay while interested parties obtain copies of the applications and evaluate their potential impact on the satellite system.[33]

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[32] *See* Comments of PanAmSat at 9 (in addition to the information proposed by the Commission, applicants should provide antenna gain and cross-polarization information, the eastern and western boundaries of the arc the applicant seeks to coordinate, and "the modulation scheme for any random access technique"); Comments of GE at 6 (applicants should provide transmit and receive frequency parameters, including bandwidth, maximum and minimum power level and density, and the antenna's off-axis gain pattern).

[33] We note that some of the suggested items which the Commission has requested that applicants provide may be unnecessary or proprietary, such as "the modulation scheme for any random access technique." For obvious reasons, applicants should not be required to disclose publicly any proprietary information.

Most of the items suggested by PanAmSat and GE are already included in non-routine applications. Some of them, such as the target satellites and/or coordination arc, would be easy to add to the "informative" for the public notice. We join PanAmSat in its suggestion that FCC software be designed to extract such information from applications for use in the "informative."[34] Other suggested items are not conducive to text summaries—for example, antenna pattern and cross-polarization information, which is generally tens of pages of charts, and bandwidth, power, and power density levels, which are tabular data, often with many entries. This information would have to be obtained from the FCC's files, although the burden associated with obtaining a copy of the application could be minimized if the Commission maintains a list of "approved" antennas with given power levels, as we suggested in our opening Comments.[35] In that case, the process of determining whether an application is likely to cause a problem will be materially eased and interested parties would have to obtain copies of applications only in those limited cases where a new or different antenna or different power levels are proposed.

C. Consumer Terminals Do Not Pose an Increased Risk of Unacceptable Interference

PanAmSat claims that "the proliferation of two-way consumer terminals" raises "special interference concerns" and that "the interference risks posed by...two-way consumer services are enormous."[36] In particular, PanAmSat believes that the large number of earth stations, that some of them may be installed by consumers, and that

[34] *See* Comments of PanAmSat at 8–9.

[35] *See* Comments of Spacenet/StarBand at 43–44.

[36] *See* Comments of PanAmSat at 12.

some of them may employ dynamic frequency assignment will make interference more likely and interfering stations more difficult to identify. PanAmSat proposes "at a minimum" that the Commission require

- system design that inhibits transmission capability until correct pointing is "quantifiably confirmed," including azimuth, elevation, and cross-polarization isolation;
- system design that allows the network operator to terminate transmissions remotely, and equipment design that prevents the end user from overriding such control;
- professional installation unless the licensee demonstrates a means of quantifiable pointing verification;
- a means to trace interference to individual subscribers "within a matter of minutes" using data readily obtainable by satellite operators;
- operators of frequency-agile systems to log frequency assignments over time; and
- review of interference problems, leading to operating restrictions or loss of license.[37]

The requirements that PanAmSat proposes are more detailed and architecturally specific than are appropriate for technical and operational rules promulgated by a regulatory authority. The proper role of the rules is to define appropriate operational standards. Instrumental restrictions such as those proposed by PanAmSat are more appropriately implemented as administrative procedures as the need arises. The Commission currently conditions authorizations upon satisfaction of certain criteria—for example, some earth station licenses are granted conditioned upon professional installation. The existing procedures appear fully adequate to deal with any concerns that may become apparent based on sound reasoning in light of experience. Furthermore, they are more flexible and more easily adapted as circumstances and needs change.

Some of PanAmSat's concerns do not appear to be warranted in light of sound reasoning based on experience. For example, it is in a network operator's interest to be able to terminate transmissions remotely for purely internal reasons—the most likely victim of rogue transmissions is its own system. Similarly, because proper performance depends upon correct aiming, customer satisfaction and commercial acceptability of the operator's own service ultimately depend on proper installation and aiming of the VSAT antennas.

Other PanAmSat suggestions are impracticable. For example, in a frequency-agile system every data packet may potentially be transmitted on a different frequency than the last. Logging this data would require storage equivalent to a substantial fraction of the total throughput of the system.

PanAmSat has not presented any evidence to support its proposals. Like the Commission's concern about random access techniques, they are merely theoretical or intuitional worries. And like the concerns about random access techniques, the industry has sufficient experience with these systems to address any of PanAmSat's concerns that actually materialize. To the extent that further experience indicates a need, administrative procedures such as license conditions can more properly address them.

D. The Commission Should Not Limit VSAT Renewal Authorizations to the Number of Antennas Installed at the Time of Renewal

In its Comments, Hughes opposed the Commission's proposal to limit renewals of VSAT licenses to the number of units installed at the time of renewal, and to require

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[37] *See id.* at 13. PanAmSat notes that it "believes that a number of companies already employ the safeguards it is proposing." *Id.* at 12.

operators who have not installed the full authorized number at the time of renewal to seek prior FCC approval to add more VSAT units.[38] We agree with Hughes and urge the Commission to abandon this proposal: it is impractical, will increase the burden on VSAT operators and the Commission's staff, and could delay the availability of services to new customers.

As the Commission is aware, we and others are in the process of launching new, satellite-based Internet access systems for consumers and small businesses, which depend on the installation of large numbers of sub-meter satellite earth stations. As such, we have sought authority to deploy a relatively large number of VSAT terminals in order to be able to provide service to new customers within a few days of their placing an order for service. In this environment, market demand controls the number of VSAT units very directly, and automatically limiting the number of authorized VSATs to those already in operation would seriously impair our ability to grow our business after renewal. Indeed, it would require us to file an application for authority to deploy additional earth stations during the pendency of any renewal application or effectively freeze our customer base during the period while the renewal application is pending. The Commission's proposal would entail the submission of wastefully duplicative applications to recover authority that had already been granted,[39] or would have obvious adverse business implications — implications that are not justified by any regulatory considerations.

Indeed, the Commission provided no rationale for its proposal. The very purpose of the FCC's blanket licensing policy is to allow for flexibility and system growth, to

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[38] *See* NPRM at Appendix B, p. 50, Section 25.121(e)(3).

[39] *See* Comments of Astrolink at 7.

reduce administrative overhead for the Commission and licensee alike, and to prevent regulatory delays.[40] Limiting renewals to the number of installed VSATs would therefore defeat the main purpose of the policy and restrict the flexibility it has brought to licensees, and the proposal should not be adopted.[41]

CONCLUSION

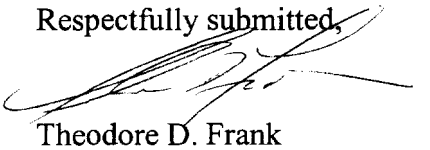
For the reasons set forth above, Spacenet/StarBand support the Commission's proposals to streamline the application process and to facilitate the prompt grant of applications for VSAT facilities. However, as explained in our opening comments and in these Reply Comments, we believe that several of the proposals in the *Notice* and some in the initial comments would impose more stringent regulations on the industry than are currently in place and would disserve the public interest by unnecessarily restricting or burdening the ability of VSAT operators to provide desirable. As we noted in our opening comments and as indicated in the Comments of other participating industry players, the self-interests of the players in the industry

[40] *See* Comments of Motient at 4; Comments of Globalstar at 4.

[41] *See* Comments of Motient at 4.

in providing high quality services that are competitive with those of competitors using other technologies will provide adequate assurance that there is no material degradation in the service offered by satellite systems.

Respectfully submitted,



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